

Application No. 10/765,437  
Amendment dated May 9, 2006  
After Final Office Action of March 10, 2006

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### **REMARKS**

Upon the undersigned's request for cancellation of claim 31 and claim 43 as well as addition of claims 49–55, claims 29, 30, 32–42, and 44–55 will be pending. Previously examined claims 29, 30, 32–42, and 44–48 have been examined and finally rejected under 35 USC Sections 102 (Kamen et al.) and 103 (Kamen et al. and additional cited references specific to particular rejections). Previously examined claim 31 and claim 43 were rejected under 35 USC Section 112, first paragraph. The cancellation of these claims moots this rejection.

For the reasons set forth below, the undersigned respectfully requests that the finality of the rejection be withdrawn and that there be further examination and consideration of the pending claims, as amended.

**35 USC Section 102:** Claims 29, 30, 37, 38, 41, and 42 assertedly anticipated by Kamen et al.

The rejection uses Kamen et al. (KAMEN) as the primary reference in the Section 102 and Section 103 rejections and therefore the undersigned focuses the comments primarily on the rejection's characterization of KAMEN and of the claims.

At a first level of analysis, there are apparent similarities between KAMEN and claims 29–48 but upon further analysis these similarities disappear and the differences become extremely apparent and significant. One major feature of KAMEN important to this discussion is that KAMEN concerns itself with **dynamic** stability of **statically** unstable vehicle systems. The presently claimed invention addresses dynamic instability of a statically stable personal vehicular system, specifically to variably control both a forward speed and a backward (or aft) speed and to control both a starboard and port direction and variable turn rate in the forward and backward directions by pitching and/or rolling a rider platform relative to an underlying statically stable motive system.

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As will be discussed further below, the rejection mischaracterizes KAMEN in several subtle points, yet these points are important in distinguishing KAMEN from the presently claimed invention.

For example, the rejection notes that KAMEN discusses (page 8, paragraph 93) that a rider may steer a KAMEN embodiment by leaning side to side. Here is what paragraph [0093] says:

[0093] In accordance with other embodiments of the present invention, leaning by user 12 may be used solely for governing fore-aft motion of vehicle 10, or, alternatively, leaning may be used solely for governing steering of the vehicle, or, for both functions.

The rejection misses one of the subtle points and equates a fore/aft or side/side lean by a user as an attitude change of a rider platform. This paragraph [0093] actually does not say this – it says that the KAMEN system responds to a user lean to control the device but given the teaching and context of the KAMEN invention, the undersigned believes that this is not a fair characterization. The undersigned believes that KAMEN teaches dynamic stability and control of fore/aft pitch and side/side roll to maintain a desired orientation of the rider platform **IRRESPECTIVE OF USER LEANING**.

For example, on page 7, paragraphs [0083] through [0086] discuss use of embodiments of the system as a prosthetic device to help with balance. Specifically in paragraph [0086] KAMEN teaches that his invention includes "... a feedback loop that takes into account changes in the vehicle's center of gravity attributable to motion of the person relative to the vehicle."

This language, coupled with other discussions throughout the KAMEN specification regarding pitch-control and inclination control teach that the rider platform tilts along with the drive system and is set by the feedback loop to provide a desired pitch

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angle when moving forward. The user leaning will be detected by a center of gravity shift and the feedback loop will set an appropriate fore/aft pitch. However, KAMEN does not expressly teach that the rider leaning actually tilts the rider platform relative to the drive system. A forward or backward lean of the user, if it shifts the center of gravity, may result in a fore/aft pitch change, as determined by the feedback loop. KAMEN does not teach relative pitching as it appears to the undersigned that the pitch of KAMEN's payload platform is a function of the platform's angular orientation about an axis of the drive system. In this case, the coupling is fixed and no changes are possible relative to the support.

Now that we have completed the general discussion of KAMEN, specific limitations of the claims are discussed below in relation to the rejections and the KAMEN reference.

*Claim 29:*

"... at least three wheels..." As KAMEN discusses numbers of wheels, particularly in connection with , the configuration of those wheels are explained to be "statically unstable" – For example the "at least three" wheel configuration shown and taught in FIG. 2 is statically unstable.

"...said wheels being spaced to stably support said vehicle and normally prevent said vehicle from tipping when placed upon said riding surface," This language recites a statically stable system unlike the statically unstable configurations taught and suggested by KAMEN. KAMEN does not teach or suggest statically stable configurations of wheels and thus his configurations do not "normally prevent said vehicle from tipping..." as statically unstable means it normally will tip when placed on the riding surface. Page 3, paragraph [0039] says: "Vehicle 18, however, is statically unstable, and, absent operation of the control loop to maintain dynamic stability, subject 10 will no longer be supported in a standing position and will fall from platform 12."

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"... a speed control coupling attaching said rider support to lower components of said vehicle and arranged to enable said rider support to tilt relative to said lower components, such tilting occurring in a generally forward or backward direction,..." – KAMEN teaches a fore/aft pitch control of the rider platform where the rider platform appears fixed to the lower components and a relative tilt is not taught or suggested. The rider platform appears to rotate about the drive axis and remains in a fixed orientation to the drive system.

Additionally, the rejection suggests a connection between the speed control coupling and a forceplate described on page 5, paragraph 61. Paragraph [0061] describes an alternate arrangement in which a forceplate is provided "...to detect leaning of the subject." Paragraph [0061] concludes with the sentence: "Appropriate force transducers may be provided to sense leftward and rightward leaning and related controls provided to cause left and right turning as a result of the sensed leaning." First, what this paragraph fails to teach or suggest is that the forceplate attaches the rider support to the lower components of the vehicle as the forceplate appears to be disposed in the platform. Second, the forceplate is not arranged to enable the rider support to tilt relative to lower components because: a) the rider support does not tilt in such a fashion; and b) any such tilting is not enabled by an arrangement of the forceplate attachment between the rider support and the lower components as recited in the claim.

This is important for a three wheel minimum system having static stability because KAMEN does not teach, nor does the rejection suggest, how a statically stable system employing a KAMEN pitch attitude control would operate. A statically stable system with three or more wheels cannot tip or rotate about a drive axis to set the desired fore/aft pitch. Thus the rejection is impermissibly combining attributes of a two-wheel KAMEN system to a three-wheel system that is not taught or suggested.

"... a speed control for enabling said rider to control the rolling speed of said vehicle in response to said forward or backward tilting of said rider support,..." – KAMEN

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appears to control speed by virtue by a detected center of gravity shift and not responsive to a forward or backward tilting of rider support. The KAMEN reference teaches that the fore/aft pitch of the system is controlled by the feedback loop responsive to the center of gravity. Thus KAMEN teaches that the rider may control the fore/aft pitch of KAMEN by controlling the speed – which is done through the center of gravity. Additionally, as noted above, since the user cannot directly set a tilt of the platform in KAMEN, the speed cannot be a function of the user tilting it.

“...a steering control for enabling said rider to tilt said rider support in a generally side-to-side direction and in response to such tilting, steer said vehicle to the side in which said rider support is tilted when said vehicle rolls upon said riding surface,...” – KAMEN, as discussed above, fails to teach a tiltable rider support as disclosed herein, much less enabling a rider to tilt such a support to control a direction.

For at least these reasons, the rejection of claim 29 as being anticipated by KAMEN is respectfully requested to be withdrawn.

*Claim 30 (dependent from claim 29)*

This claim recites enablement of a rolling direction reverser “when said rider support is tilted...” As the KAMEN rider support tilts responsive to the speed which is set by the feedback loop in response to the center of gravity, this limitation is respectfully asserted not to be taught or reasonably suggested by KAMEN. For at least this reason, and because of the reasons recited above for claim 29, the rejection of claim 30 as being anticipated by KAMEN is respectfully requested to be withdrawn.

*Claim 37 (independent)*

Claim 37 is respectfully asserted to be patentable for all the reasons set forth above in the discussion of claim 29. For at least these reasons, the rejection of claim 37 as being anticipated by KAMEN is respectfully requested to be withdrawn.

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*Claim 38 (dependent from claim 37)*

Claim 38 is respectfully asserted to be patentable for all the reasons set forth above in the discussion of claim 30. For at least this reason, and because of the reasons recited above for claim 37, the rejection of claim 38 as being anticipated by KAMEN is respectfully requested to be withdrawn.

*Claim 41 (independent)*

Claim 41 is respectfully asserted to be patentable for all the reasons set forth above in the discussion of claim 29. For at least these reasons, the rejection of claim 41 as being anticipated by KAMEN is respectfully requested to be withdrawn.

*Claim 42 (dependent from claim 41)*

Claim 42 is respectfully asserted to be patentable for all the reasons set forth above in the discussion of claim 30. For at least this reason, and because of the reasons recited above for claim 41, the rejection of claim 42 as being anticipated by KAMEN is respectfully requested to be withdrawn.

**35 USC Section 103(a):** Claims 36 and 48 assertedly unpatentable over Kamen.

Claims 36 recite a pair of biasing springs, each constrained to deform "...when said rider support is tilted..." in a specified manner. First, as noted above, the rider platform of KAMEN is not tiltable thus the resultant responsive to the claimed tilting cannot be satisfied by KAMEN. Second, the rejection does not properly characterize the page 3, paragraph [0040] language relating to the "station keeping" mode or to the "kickstand" mode. The undersigned believes that KAMEN, like the embodiment of the present invention recited in claims 36 and 48, have provision for safety. However, the KAMEN system achieves this in a markedly different way than that recited in the claims and thus

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the undersigned respectfully asserts that claims 36 and 48 are not obvious in light of KAMEN.

KAMEN has a control loop for setting a fore/aft pitch of the rider platform. This control loop uses the propulsion system/motors/drive system to appropriately apply a desired torque to the dynamically stable system and set the desired fore/aft pitch in any given situation. This setting of a fore/aft pitch of a rider platform fixed to a drive axis is not biasing as understood to a person of ordinary skill in the art.

Further, the system artificially imposes these modes on the system when it is powered and dynamically stable. The station keeping mode appears to park the vehicle, disabling a user from moving the vehicle by changing the center of gravity (such as by leaning or shifting weight) and the user appears to be unable to change the fore/aft pitch while in this mode. The kickstand mode is operated by a sensor on the rider platform. When the user dismounts, the kickstand mode is imposed on the system, irrespective of the fore/aft pitch at the time of dismounting.

The rejection's assertion of motivation to use springs in lieu of the electro-mechanical control loop is respectfully asserted to be reconsidered. Given the complexity of the control system and the fact that the KAMEN system is statically unstable with the control loop responding to center of gravity shifts and other operational parameters (e.g., speed) it is respectfully asserted by the undersigned that it would not occur to a person of ordinary skill in the art considering KAMEN to substitute mechanical springs for the control loop, should it even be possible to do so. The rejection does not explain how the other functions of the control loop will be satisfied.

Claim 48 includes recitations of biasing means for achieving specified results. For the reasons discussed above in connection with claim 36, the rejection is respectfully asserted to be improper.

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The rejections of claims 36 and 48 are respectfully requested to be reconsidered and withdrawn at least in light of the above comments, both in respect to the specific rejections as well as to the discussion above concerning independent claims 29, 37, and 41.

**35 USC Section 103(a):** Claims 32, 39 and 44 assertedly unpatentable over KAMEN in view of White Sr.

The rejection states that a motivation to combine these references includes provision of a "quickly removed steadying handle..." for identified reasons. As noted above, KAMEN extensively teaches dynamic stability and therefore it is respectfully asserted that providing a handle for "steadying" a use is counter to the teachings of KAMEN. KAMEN, as noted above, teaches use of embodiments of his vehicle for Parkinson's patients, among other users. EVEN in this context, KAMEN does not provide for a steadying handle as that function is achieved by the control loop. The undersigned respectfully asserts that there is, in fact, no motivation to combine WHITE with KAMEN as asserted by the rejection.

The rejections of claims 32, 39, and 44 are respectfully requested to be reconsidered and withdrawn at least in light of the above comments, both in respect to the specific rejections as well as to the discussion above concerning independent claims 29, 37, and 41.

**35 USC Section 103(a):** Claims 33, 40, and 45 assertedly unpatentable over KAMEN in view of Favorito.

These claims (33, 40, and 45) recite, among other limitations, "...at least one handlebar for stabilizing said rider while said rider is situated on said rider support,..."

As noted above in the discussion of the rejection of claims 32, 39, and 44 for obviousness, KAMEN does not require a stabilizing handle.



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The rejections of claims 33, 40, and 45 are respectfully requested to be reconsidered and withdrawn at least in light of the above comments, both in respect to the specific rejections of claims 32, 39, and 44 above as well as to the discussion above concerning independent claims 29, 37, and 41.

**35 USC Section 103(a):** Claims 34 and 46 assertedly unpatentable over KAMEN in view of Martin.

The rejection asserts that combination of Martin with KAMEN is motivated by a recognition of a realization of simplification and reduced cost of a wheel system. The undersigned respectfully asserts that it would not be possible to use truck wheel assemblies with a KAMEN system and that a person of ordinary skill in the art would recognize that doing so would effectively destroy the KAMEN invention. KAMEN relies heavily upon its drive mechanism that, in cooperation with the complex control system, is able to set and maintain a desired fore/aft pitch of the vehicle under varying conditions. It is believed that substitution of truck wheel assemblies would not be possible to achieve with a KAMEN system, and if it were possible then significant and extension modification of the control system and operation would be necessary and those modifications are not explained in the rejection.

The rejections of claims 34 and 46 are respectfully requested to be reconsidered and withdrawn at least in light of the above comments, both in respect to the specific rejections of these claims 34 and 46 above as well as to the discussion above concerning independent claims 29, 37, and 41.

**35 USC Section 103(a):** Claims 35 and 47 assertedly unpatentable over KAMEN in view of Martin and further in view of Buscalia. (The rejection references a rejection of Martin as applied to claims 16 and 26 which were not pending so the undersigned assumes this to be as applied in the rejection of claims 34 and 46)

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The rejections of claims 35 and 47 are respectfully requested to be reconsidered and withdrawn at least in light of the above comments, both in respect to the specific rejections of claims 34 and 46 above as well as to the discussion above concerning independent claims 29, 37, and 41.

As noted above, the undersigned respectfully requests reconsideration of all the outstanding rejections of the presently pending claims and that the finality of the rejection be withdrawn for consideration of the newly added claims.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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